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Preliminary Processed Data for

**Tarzana - Cedar Hill Nursery A**

from the Northridge Earthquake

of 17 January 1994

by

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REPORT OSMS 94-12B  
California Strong Motion Instrumentation Program (CSMIP)

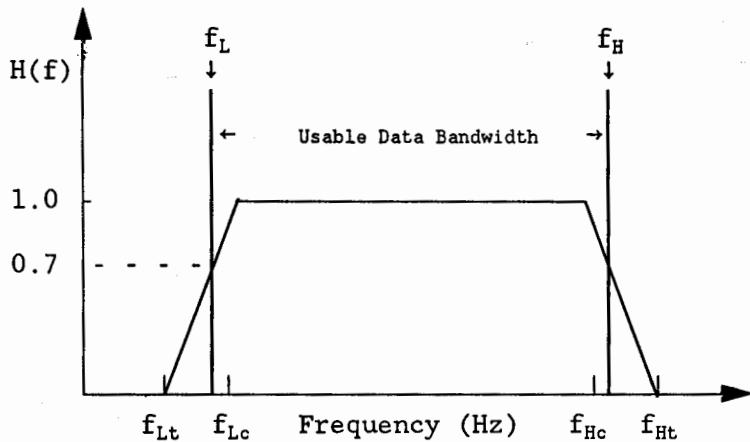
The processed data plots are presented in the following order:

1. Phase 1 (Vol. 1) data: uncorrected accelerations. Acceleration for the first 22 seconds are plotted with a common scaling factor for all channels; three channels are plotted on one page. This plot is followed by another plot of the full processed length (60 seconds) with each channel individually scaled.
2. Phase 2 (Vol. 2) data: instrument, tilt and baseline-corrected acceleration, velocity and displacement. The data for the full processed length are plotted with equal scaling for all channels. The filter frequencies used in the processing (0.05-0.10 to 23.0-25.0 Hz) are indicated on the plots (see Definition of Usable Data Bandwidth).
3. Phase 3 (Vol. 3) data: response spectra. The pseudo-velocity spectra (PSV), the pseudo-acceleration spectra (PSA), the displacement spectra (SD), and the Fourier amplitude spectra (FS) are presented on a tripartite logarithmic plot for each channel. The spectra are plotted for periods within the filter bandwidth used in the Vol. 2 processing. In addition, the absolute acceleration spectra (SA) for 0%, 2%, 5%, 10%, and 20% dampings are plotted against period for periods from 0 to 4 seconds with linear-linear scaling.

Note: A release of preliminary processed data is being made because the maximum acceleration of some components were not recorded on the film. Due to the importance of this record, CSMIP staff are carefully estimating the motion from this accelerogram. In the meantime, the preliminary data are being released so that users will not be delayed from analyzing the data.

### DEFINITION OF USABLE DATA BANDWIDTH

The filter bands for each record are indicated on the plots for the Phase 2 and Phase 3 data. In standard processing, the digitized data are processed and filtered using Ormsby filters. The data are first low-pass filtered using a high-frequency filter with a corner frequency of 23 Hz and a roll-off termination frequency of 25 Hz. Then the data are high-pass filtered using a low-frequency filter with a corner frequency of 0.07 Hz and a roll-off termination of 0.05 Hz. Therefore, the Phase 2 data is the result of the digitized data being filtered by the bandpass filter  $H(f)$  with ramps as shown in the figure:



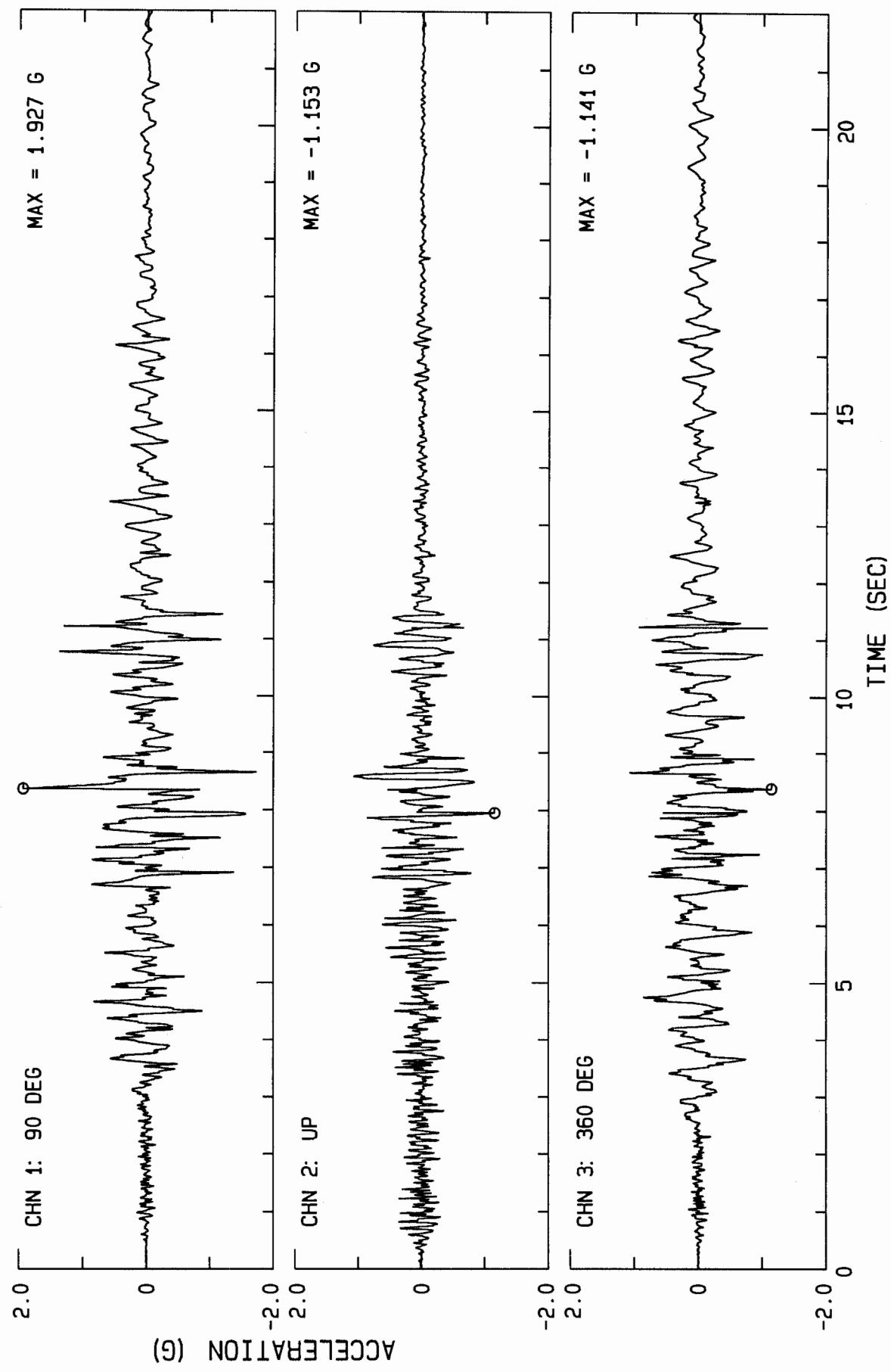
The Usable Data Bandwidth is defined as the band between frequencies  $f_H$  and  $f_L$ , where  $f_H$  and  $f_L$  are the -3 dB points on the high-frequency and low-frequency ramps, respectively. The value of  $H(f)$  is approximately equal to 0.7 for -3 dB (see Notes). The user should only use these data for analyses within this bandwidth.

#### Notes:

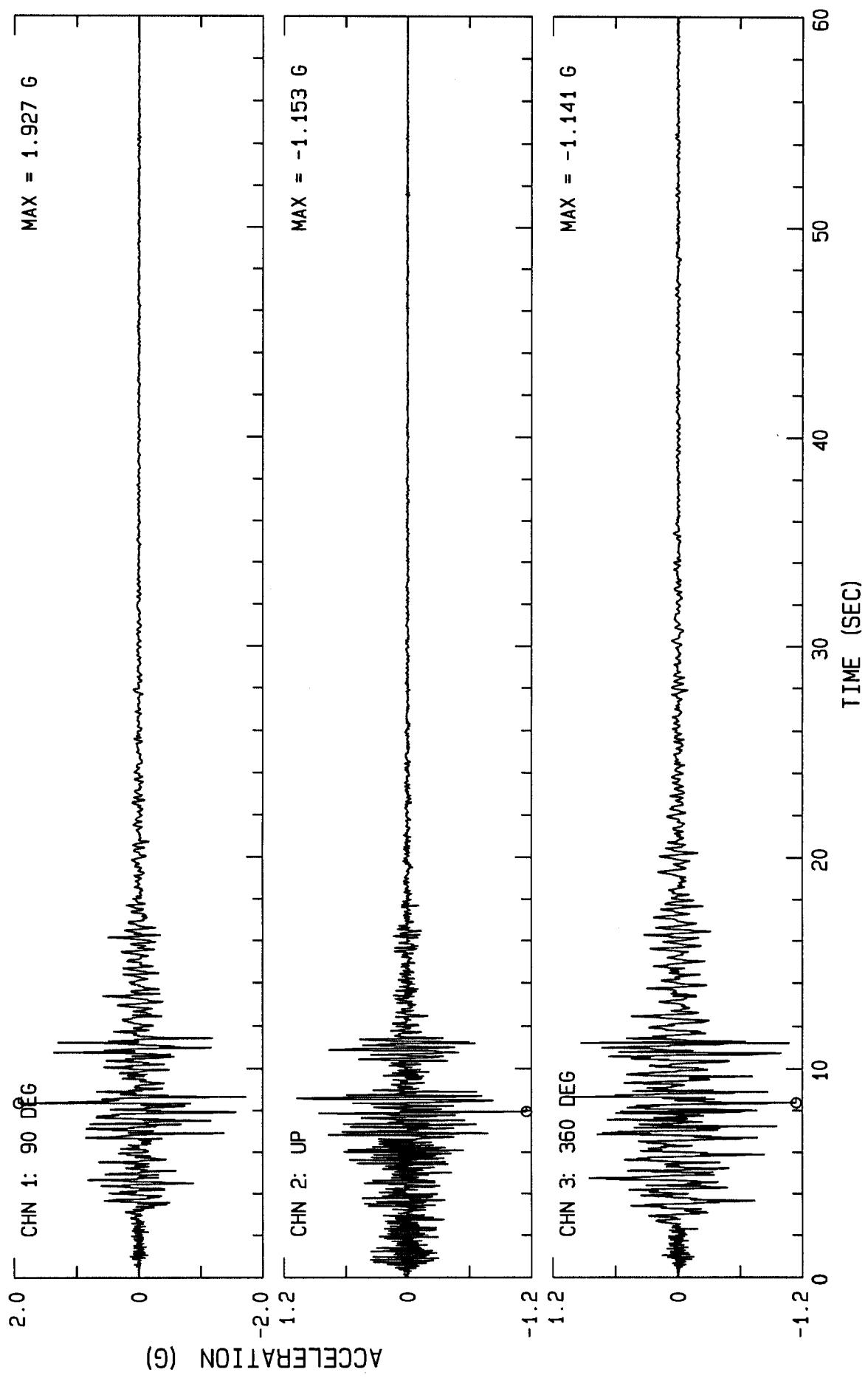
- 1) The values of  $f_H$  and  $f_L$  can be calculated from the corner frequencies ( $f_{Hc}$ ,  $f_{Lc}$ ) and the roll-off termination frequencies ( $f_{Ht}$ ,  $f_{Lt}$ ) used in the processing by using the formulas  $f_H = f_{Hc} + 0.3 * (f_{Ht} - f_{Hc})$  and  $f_L = f_{Lc} - 0.3 * (f_{Lc} - f_{Lt})$ . For example, the Usable Data Bandwidth for data bandpass-filtered with ramps at 0.30 to 0.60 Hz and 23.0 to 25.0 Hz is 0.51 Hz to 23.6 Hz (0.042 to 2.0 seconds period).
- 2) It is common in signal processing to plot  $20 \log_{10}[H(f)]$  versus frequency, and express the ordinate value in decibels (abbreviated dB). Accordingly, 0 dB corresponds to a value of  $H(f)$  equal to 1; 20 dB is equivalent to  $H(f) = 10$ , and -20 dB corresponds to  $H(f) = 0.1$ . Thus, at the -3 dB frequency point, the amplitude of the transfer function,  $H(f)$ , is reduced to 0.7, while the power transmitted by the filter,  $H^2(f)$ , is reduced to 0.5.

NORTHRIDGE EARTHQUAKE OF JAN 17, 1994 CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A

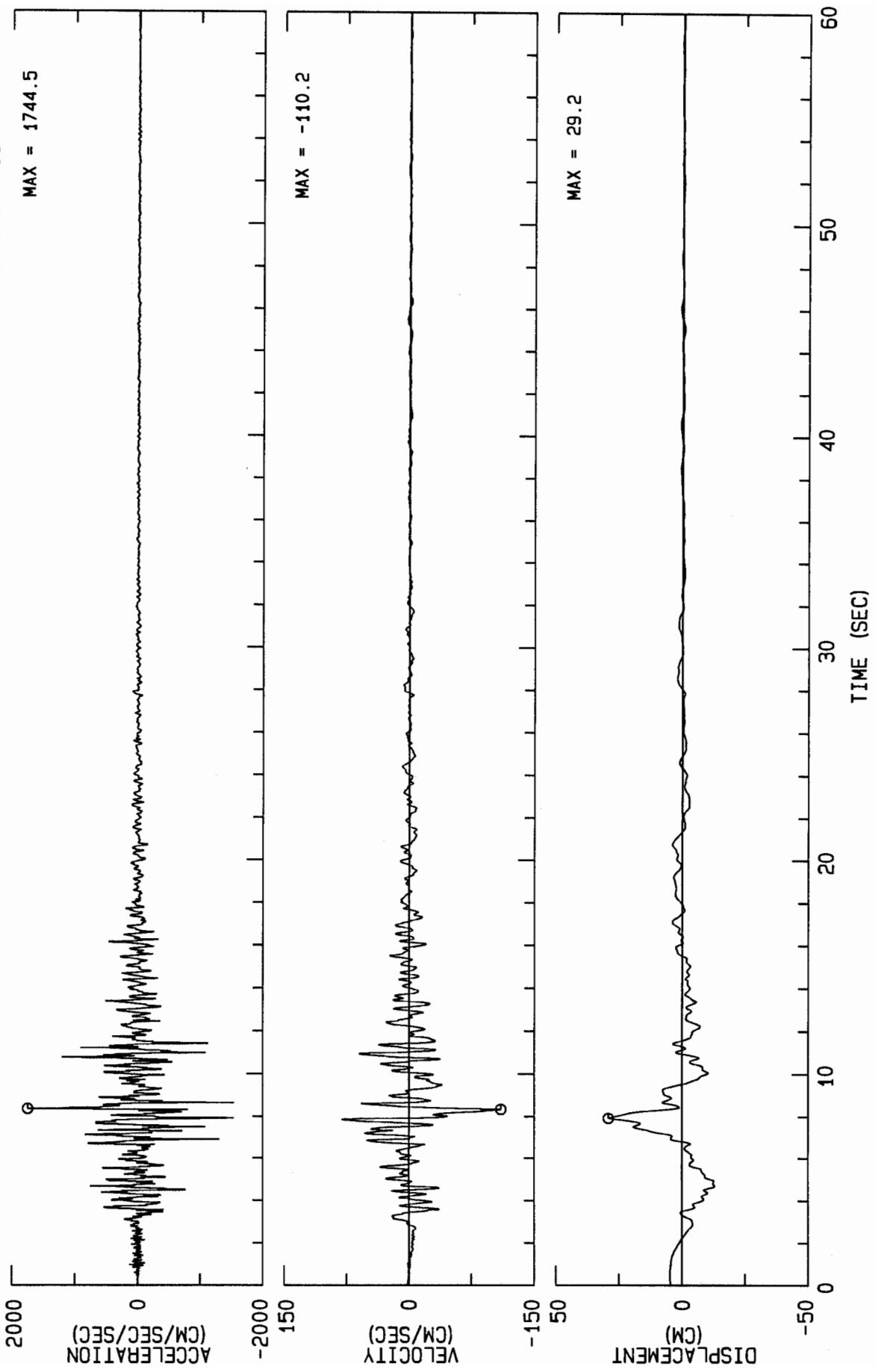
UNCORRECTED ACCELEROMGRAM 24436-S1614-94017.02 090994.0837-QN94A436



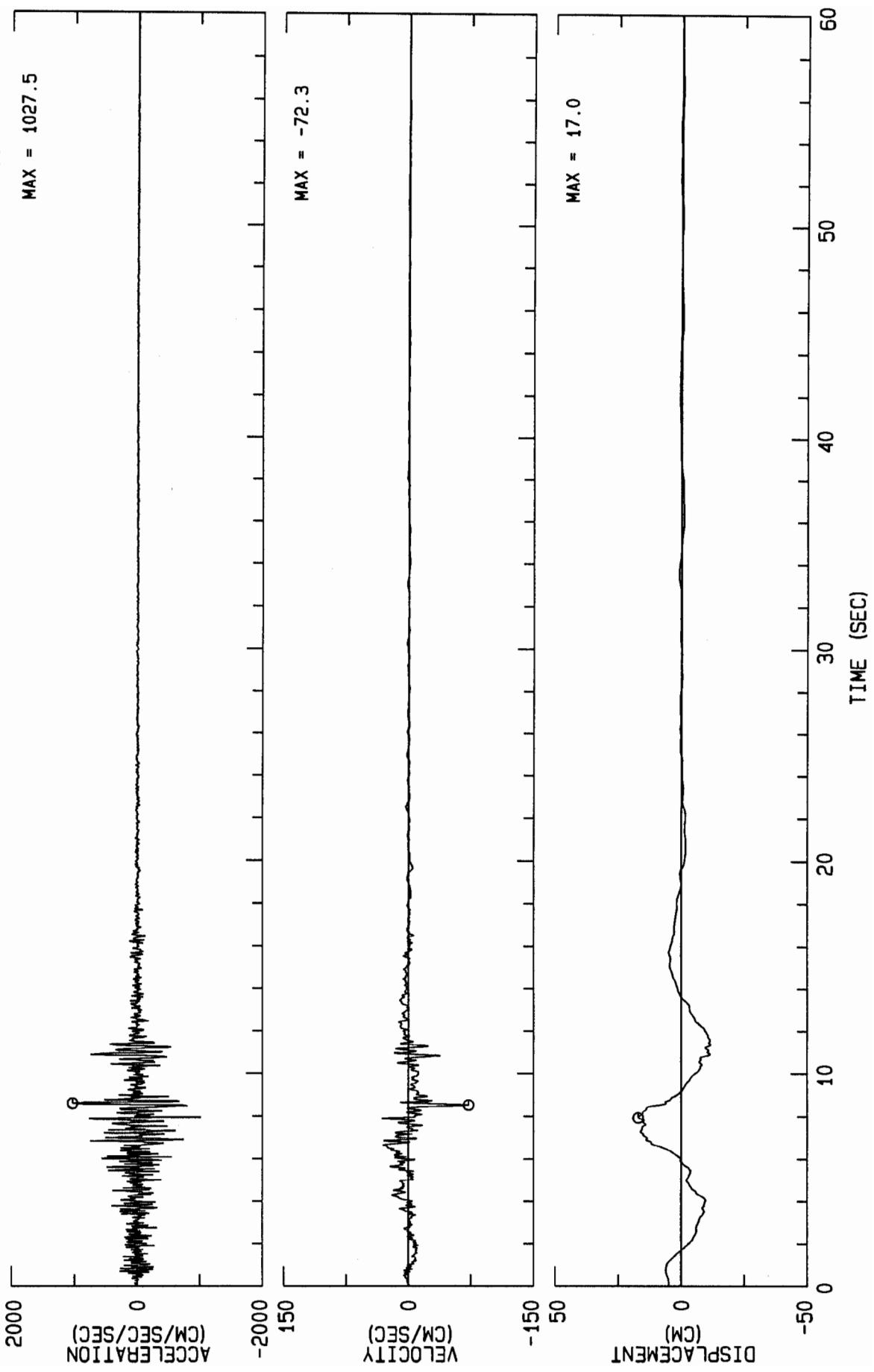
NORTHRIDGE EARTHQUAKE OF JAN 17, 1994 CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A  
UNCORRECTED ACCELERGRAM 24436-S1614-94017.02 090994.0837-0N94A436



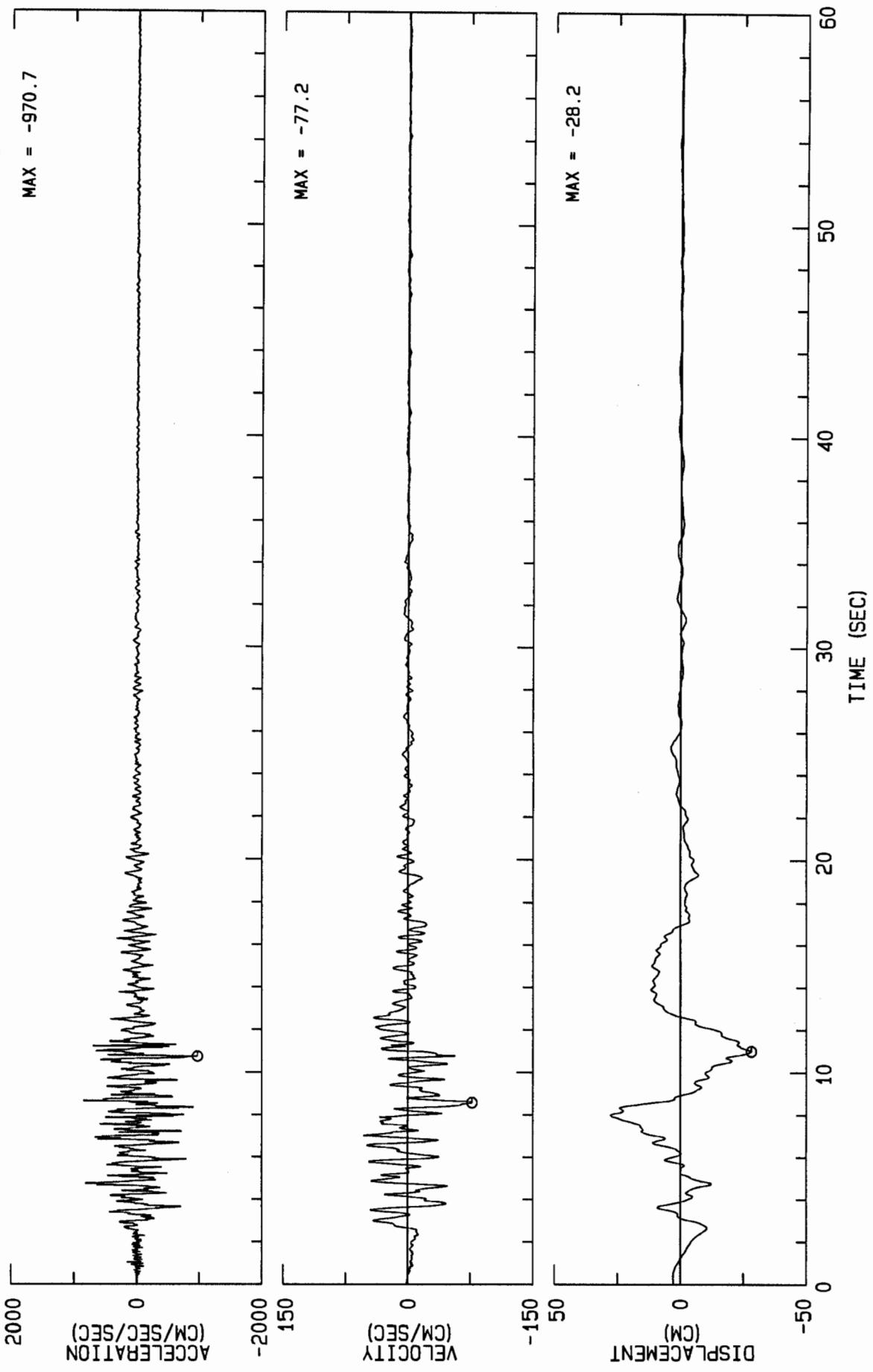
NORTHRIDGE EARTHQUAKE OF JAN 17, 1994 CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A CHN 1: 90 DEG  
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT  
FILTER BAND: .05-.10 TO 23.0-25.0 Hz. 24436-S1614-94017.02 090994.0839-QN94A436



NORTHRIDGE EARTHQUAKE OF JAN 17, 1994 CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A CHN 2: UP  
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT  
FILTER BAND: .05-.10 TO 23.0-25.0 Hz. 24436-S1614-94017.02 090994.0839-QN94A436



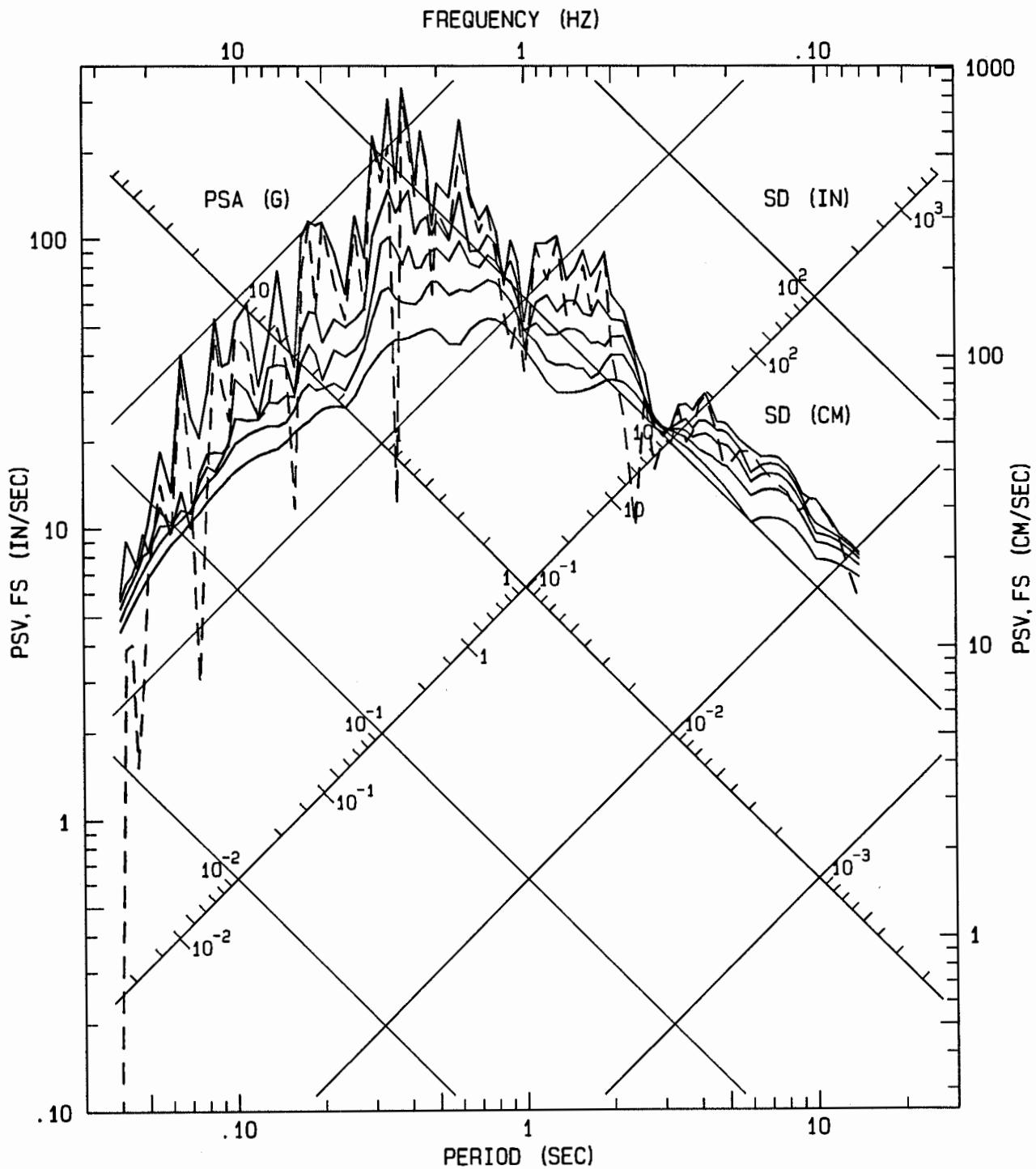
NORTHRIDGE EARTHQUAKE OF JAN 17, 1994 CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A CHN 3: 360 DEG  
INSTRUMENT-CORRECTED AND BANDPASS-FILTERED ACCELERATION, VELOCITY AND DISPLACEMENT  
FILTER BAND: .05-.10 TO 23.0-25.0 Hz. 24436-S1614-94017.02 090994.0839-QN94A436



NORTHRIDGE EARTHQUAKE OF JAN 17, 1994      CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A  
CHN 1: 90 DEG

ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.10 TO 23.0-25.0 Hz.  
24436-S1614-94017.02 090994.0841-0N94A436

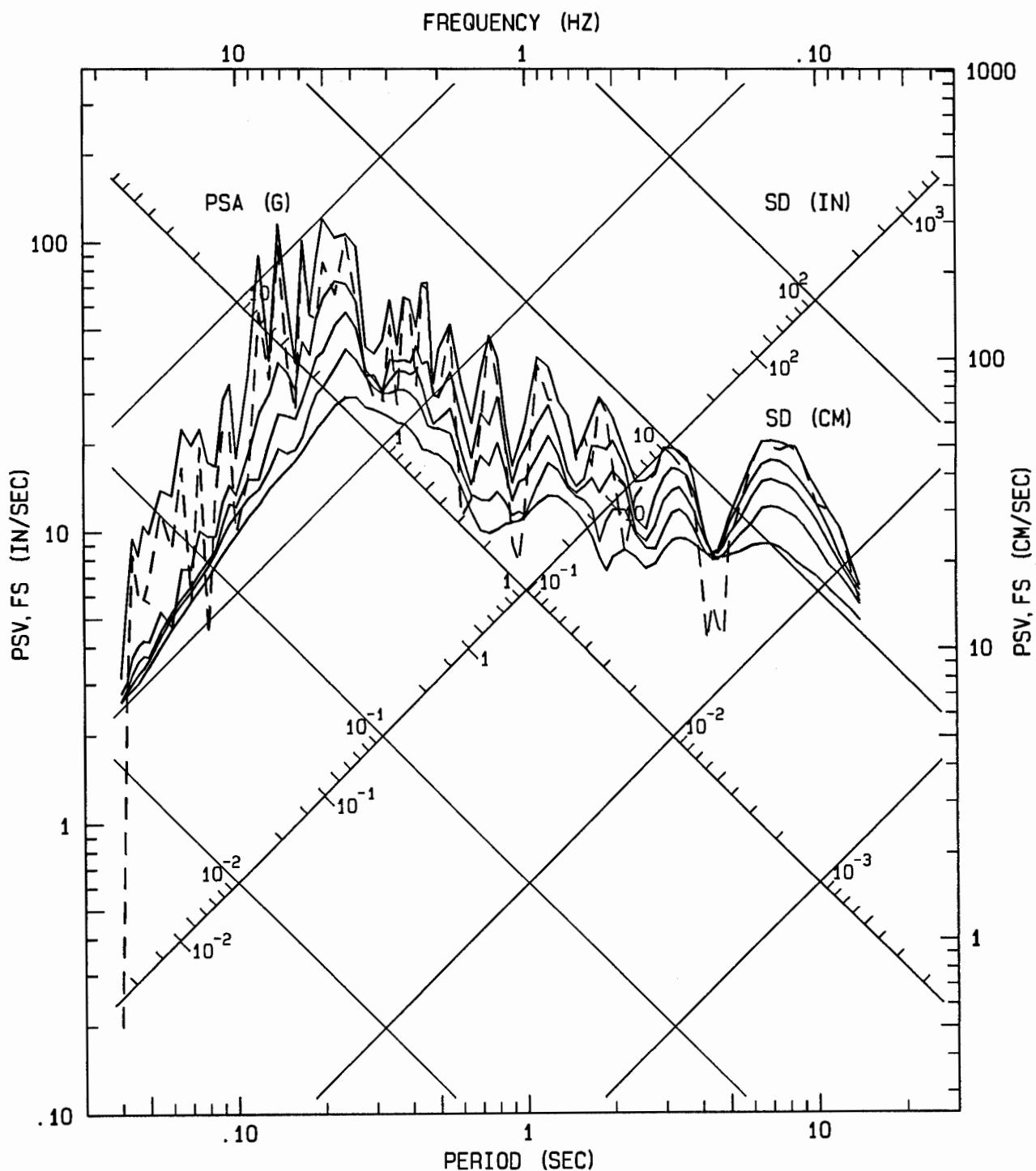
— RESPONSE SPECTRA: PSV, PSA & SD    — — FOURIER AMPLITUDE SPECTRUM: FS  
DAMPING VALUES: 0, 2, 5, 10, 20%



NORTHRIDGE EARTHQUAKE OF JAN 17, 1994      CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A  
CHN 2: UP

ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.10 TO 23.0-25.0 Hz.  
24436-S1614-94017.02 090994.0841-QN94A436

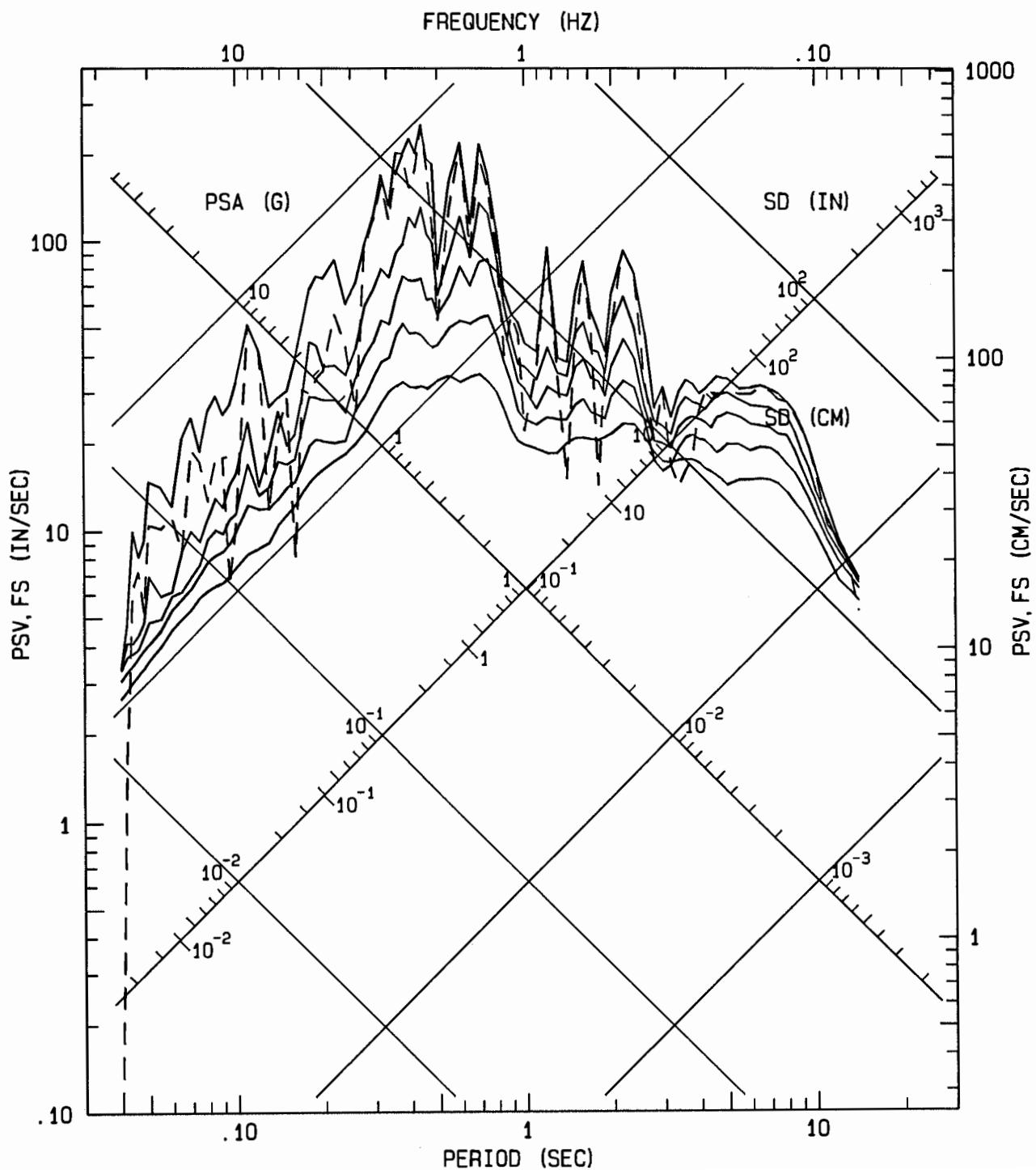
— RESPONSE SPECTRA: PSV, PSA & SD    — — FOURIER AMPLITUDE SPECTRUM: FS  
DAMPING VALUES: 0, 2, 5, 10, 20%



NORTHRIDGE EARTHQUAKE OF JAN 17, 1994      CSMIP PRELIMINARY PROCESSING  
 TARZANA - CEDAR HILL NURSERY A  
 CHN 3: 360 DEG

ACCELEROGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.10 TO 23.0-25.0 Hz.  
 24436-S1614-94017.02 090994.0841-0N94A436

— RESPONSE SPECTRA: PSV, PSA & SD      - - - FOURIER AMPLITUDE SPECTRUM: FS  
 DAMPING VALUES: 0, 2, 5, 10, 20%



NORTHRIDGE EARTHQUAKE OF JAN 17, 1994 CSMIP PRELIMINARY PROCESSING  
TARZANA - CEDAR HILL NURSERY A  
ACCELEROMGRAM BANDPASS-FILTERED WITH RAMPS AT .05-.10 TO 23.0-25.0 Hz.  
24436-S1614-94017.02 090994.0841-QN94A436

